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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/920,911	08/02/2001	Mo-Chiun Yu	67,200-506	7142

7590 09/24/2002

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EXAMINER

BOOTH, RICHARD A

ART UNIT PAPER NUMBER

2812

DATE MAILED: 09/24/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/920,911

Applicant(s)

YU ET AL.

Examiner

Richard A. Booth

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-2, 7-8, and 12 are rejected under 35 U.S.C. 102(b), as best understood, as being anticipated by Admitted prior art.

Admitted prior art shows the invention substantially as claimed including defining a sequential and repetitive thermal oxidation and partial stripping method for forming upon a semiconductor substrate 10 a plurality of gate dielectric layers (14a, 18a, 22) having a maximum number (in this case, 3) of differing thicknesses formed employing a corresponding maximum numbered (again, 3) plurality of thermal oxidation process steps; sequentially and repetitively thermally oxidizing and partially stripping the semiconductor substrate (see Figures 2 and 4 of specification) to form thereupon the plurality of gate dielectric layers having less than the corresponding maximum numbered plurality of thermal oxidation process steps (see Figure 4); and supplementally performing a thermal annealing process 24 (see Figure 5) to compensate for forming thereupon the plurality of gate dielectric layers having less than the corresponding maximum numbered plurality of differing thicknesses formed employing less than the corresponding

Art Unit: 2812

maximum numbered plurality of thermal oxidation process steps (see page 14, line 1 to page 20, line 20 of specification).

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 3-6 and 9-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted prior art.

Admitted prior art is applied as above but fails to expressly disclose wherein the maximum numbered plurality is greater than three, wherein the plurality of differing thicknesses range from 10-40 angstroms for a low thickness to 50-200 angstroms for a high thickness, and where the supplemental thermal annealing is undertaken between forming the gate dielectric layers or prior to forming the gate dielectric layers.

However, a prima facie case of obviousness is still established because the repetition of process steps is obvious. Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to optimize the various thicknesses based on the particular application and the specific thickness would not lend patentability absent the showing of unexpected results. With respect to the particular order of process steps, this has also held

Art Unit: 2812

to have been obvious absent the showing of new or unexpected results (see *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946)).


### ***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is 308-3446. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Niebling can be reached on 308-3325. The fax phone numbers for the organization where this application or proceeding is assigned are 308-7724 for regular communications and 308-7724 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 308-1782.



Richard A. Booth  
Primary Examiner  
Art Unit 2812

September 20, 2002